

or part of a specimen of this species is known to exist in any museum.

10. *Balæna cisarctica*, the Black Whale of the whalers of the east coast of the United States of America, may be the same as *B. nodosa*. There is a skeleton in the Museum of the Academy of Sciences, Philadelphia; and it is probably a skeleton of this species that "is exposed to all weathers on the roof of the Museum of Comparative Zoology at Cambridge, Massachusetts." (See Agassiz, Rep. 1864-65.)

How far the species indicated range beyond the habitats whence they were received is yet to be discovered and recorded. No doubt their range is influenced by many local circumstances (peculiarities in the currents, and disposition of the food) that are not easily observed or understood. For example, Capt. Maury observes:—"The Sperm-Whale, according to the result of this chart, appears never to double the Cape of Good Hope. It doubles Cape Horn. Since this fish delights in warm water, shall we not expect to find off Cape Horn an under-current of warm water heavier with its salt?" (Maury, Whale-Charts, p. 267.)

XXXII.—On a Variety of *Spongilla Meyeni* from the River Exe, Devonshire. By H. J. CARTER, F.R.S. &c.

*Spongilla Meyeni* (*Ephydatia*, Gray)\*, var. *Parfitti*, Carter.

Massive, flat, more or less lobed, sessile, spreading. Colour greenish, yellowish. Texture friable. Structure reticulate. Seed-like bodies spheroidal, accumulated towards the base, largest about  $\frac{1}{100}$  inch in diameter. Spicules of skeleton fusiform, slightly arched, acerate, abruptly pointed, largest  $\frac{1}{50}$  inch long; of two kinds, smooth and spinous; one-third of the largest thickly set with short vertical spines throughout, except towards the points. Spicules of seed-like body birotulate,  $\frac{1}{200}$  inch long, more or less sparsely scattered throughout the wall of the seed-like body, wherein they are arranged vertically, with the outer rotule projecting a little beyond the amorphous (siliceous?) substance that chiefly keeps the whole together; rotules deeply dentate, stellate, wider in diameter than the spicular shaft which unites them; shaft cylindrical, the same size throughout.

*Hab.* River Exe, Devonshire; Salmon-pool Weir, near Exeter. On a beam of wood over which the water falls. In masses attaining a maximum length of 1 foot, with  $1\frac{1}{4}$  inch thickness (Mr. Parfitt).

\* Proc. Zool. Soc. Lond. May 9, 1867, p. 550.

*Obs.* This *Spongilla* chiefly differs from *Sp. Meyeni* of Bombay in the decidedly spinous character of one-third of its largest spicules, while about the same proportion in the Bombay species can be only termed "incipiently spinous." The excess in size of the elementary parts generally of the Bombay species over those of the variety in the river Exe amounts to nothing, specifically considered.

But there is a much more decided difference between var. *Parfitti* and the birotulate English species termed *Sp. fluviatilis*, which also grows in the river Exe, inasmuch as the spicules of the skeleton in the latter are *all* smooth, the shaft of the birotules, somewhat *constricted* in the centre, approaching to hour-glass shape, with the margin *only* of the rotules minutely dentate, almost fringed\*.

I am indebted to my intelligent friend, the able naturalist of Exeter, Mr. E. Parfitt, for having brought to my notice the existence, in the river Exe, of the variety and species of *Spongilla* above mentioned, where this gentleman found them some time since; and, he having kindly submitted them (in the dry state, with his own notes of what they were when alive) for my examination and publication, I cannot do better than dedicate the variety to him.

The indistinct colour of var. *Parfitti* may perhaps be attributed to the filtering position in which it grows, viz. on the beam of the weir over which the Exe falls at the Salmon-pool, if not also the more spinous state of its spicules generally; while the position of *Sp. fluviatilis*, taken from the Canal and parts of the Exe just above, where Mr. Parfitt found it incrusting the stems and leaves of *Anacharis* and on hard substances respectively, presents not only the usual fawn-colour of Sponges in general, but also a less spinous state of the spicules—perhaps from a less agitated state of the water in which it grows.

I still adhere to the term "seed-like body," instead of adopting that of "ovary," used by Dr. Bowerbank; for where, literally, we cannot yet make "head or tail" of an organism, it certainly is premature to designate any part of it by a term which is essentially connected with the *true* process of generation. Moreover I have already pointed out the identity in structure and composition of the seed-like body of *Sp. Carteri* with the winter-egg of the Bryozoa†; and I am pleased to find just now, by chance, that Meyen, long before this, had

\* See also Dr. Bowerbank's figures and descriptions, Proc. Zool. Soc. Lond. Nov. 24, 1863; and Ray Soc. publ.

† Annals, 1859, vol. iii. p. 331.

stated, "they [the seed-like bodies] are similar to what are denominated the winter-eggs of Polypes"\*.

I have also lately observed that the seed-like bodies in *Sp. Carteri* (which *Spongilla* grows rapidly round the stems of herbaceous plants during the six months that the upper parts of the freshwater tanks in Bombay are filled) are developed towards the periphery, that *Sp. plumosa* develops its seed-like bodies throughout all parts of its structure almost equally, while the three other Bombay species develop theirs respectively chiefly towards the base or first-formed parts.

In Prof. James-Clark's paper entitled "*Spongia ciliatæ* as *Infusoria flagellata*," now being republished in the 'Annals,' the author—after having most carefully examined *Leucosolenia* (*Grantia*) *botryoides*, Bowerbank, in connexion with a number of flagellate infusoria, both new and old in description—states his "conviction that the true ciliated *Spongia* are not Rhizopoda in any sense whatever, nor even closely related to them, but are genuine compound *flagellate Protozoa*."

Thus a flagellate infusorium would have to be considered the animal expression of *Grantia*; and if it can also be shown that these flagellate infusoria can reproduce their sponges respectively, directly or indirectly, by the *true* process of generation, and that all the sponge-cells which take in food, both ciliated and unciliated, receive it through an oral orifice, and not directly through any part of their bodies, then, so far, the Sponges can be disconnected from the Rhizopoda, and, I expect, generally will have to be regarded in the light in which the sagacious Professor of Natural History in the Agricultural College of Pennsylvania views the *Spongia ciliatæ*.

Still, if this be shown, I cannot yet see to what extent it could disassociate the *Spongiadæ* from the Rhizopoda, which evidently possess a like power of polymorphism.

But Prof. Clark's paper is far too able to justify a hasty conclusion or cursory criticism in any respect; and therefore this is not the time or place for me to add more than that it appears to possess extraordinary merit, which will be realized the more it is studied by the practical microscopist, who at the same time feels sensible of the duty he is performing towards the public in directing their attention to that end of the scale of organized beings concerning which we are still so profoundly ignorant.

P.S. Mr. Parfitt adds that *Spongilla fluviatilis* is plentiful

\* Johnston, Brit. Sponges, footnote, p. 154 : 1842.

in the Exe and in the canal near Exeter, throughout the summer months; but, by attaching itself to plants which die down in the autumn, the specimens are all swept away by the winter floods.

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XXXIII.—On the *Spongix ciliatx* as Infusoria flagellata; or Observations on the Structure, Animality, and Relationship of *Leucosolenia botryoides*, Bowerbank. By H. JAMES-CLARK, A.B., B.S., Professor of Natural History in the Agricultural College of Pennsylvania.

[Continued from p. 215.]

§ 12. *Astasia trichophora*, Clap. Pl. VI. figs. 45, 46.

The transition from the mononematous *Monas*, *Codosiga*, *Leucosolenia*, &c. to those heteronematous Flagellata which possess at the same time a probosciform and a gubernaculum flagellum is most aptly exemplified by that curious mimetic combination of *Amœba* and *Anisonema* known as *Astasia trichophora*, Clap. (*Trachelius trichophorus*, Ehr.). At first sight it appears to be capable of all the abrupt retrogressive motions and short turnings of an *Anisonema* (figs. 65–69), without being endowed with a similar means of locomotion. One is not long, however, in discovering the homologue of the trail (*fl<sup>2</sup>*) or rudder (*gubernaculum*) of the latter in the posterior abdominal, triangular prolongation (fig. 45, *fl<sup>2</sup>*) of the body of the former. That this is the true interpretation of the prolongation is warranted not only by the use to which it is put, as a sort of *point d'appui* during the amœboid retroversions of the body, but also by its persistent form whilst the animal is contorted into a shapeless writhing mass. In the midst of the paucity of distinctive topography, we are also furnished by this organ, if I may so call it, with a basis of ready discrimination between the practically ventral and dorsal sides of the body; for, although it may not lie strictly in the central line of progress during reptation (nor could we expect to find it there upon being referred to its homological relation to the asymmetrically attached *gubernaculum* of *Anisonema*), it none the less belongs to the reptant side of the animal, and, as it were, controls its motions and acts as a keel, upon which the posterior end of the body vibrates and reels from side to side. Finally, in reference to this point, it may be added that this species does not swim, properly speaking, nor has it the character of the revolving natant forms, such as Dujardin separated from the *Astasia* of Ehrenberg and described under the name of *Peranema*.